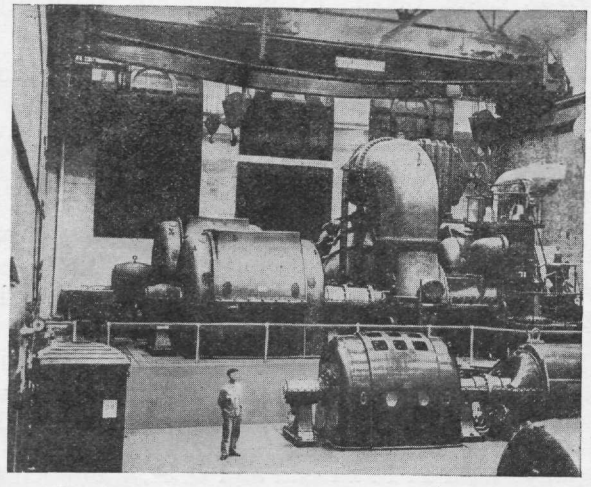
WESTINGHOUSE NEWS

At 5:20 P. M., March 8, 1920, there was finished what, from available data, is a world's record for the continuous operation of large steam turbines, in that the unit was stopped for the first time since the early morning of December 15, 1919. This continuous operation covered a period of 84 days, 11 hours and 36 minutes, and established a world's record for the operation of multiple element steam turbines of the cross compound type. The machine was the 45,000 K. W. turbine, manufactured by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., for Narragansett Electric Lighting Co.



During this run there were generated 51,104,000 K. W. H., or considerably more than the total yearly output of the Narragansett Company for any year prior to 1915. The average daily output was three or four times the maximum possible annual output of the first machines owned by the Narragansett Company. During this record run it turned out about 84.2 per cent of the total station output. Another interesting feature in connecion with this record is the wide variation in load at various times, from a minimum of 6,000 K. W. to a maximum of 41,000 K. W.

To produce this output the machine used approximately 609,000,000 pounds of city water, which required over 71,000,000 pounds of coal to convert it into steam at 210 pounds pressure, and to condense this steam and maintain an average vacuum of better than 28 inches; approximately 32,000,000,000 pounds of water being taken in from and passed back to the Providence River. The twin-condenser pumps are driven by two 512 H. P. turbines and are capable of circulating 18,000,000 pounds of water per hour. Considering the fact that about 80 per cent of the total heat in the steam is absorbed by the condensing water, the city of Providence is enjoying among its many great advantages that of having a heating system continuously warming the waters of the Providence River, thereby keeping the upper reaches of the bay open to navigation all through the severe winter.

Some conception of the enormous amount of steam and air used by this machine may be had by some homely comparisons. During the present run, sufficient steam was passed through the machine to equal about 540 times the entire weight of both electric and steam ends and the bedplates. Also to keep the generators cool, over 18,000,000,000 cubic feet of air were passed through the generators, which equals 2,000 times the total weight of the generators and their bedplates. Sufficient air is pumped through the generator each hour to fill the turbine room seventeen times.

Not the least important feature by far, to promote continuous operation, is the self-contained lubricating system, which contains 800 gallons of oil. This oil is pumped through the cooler, which keeps down the temperature to the bearings at the rate of 600 gallons per hour, and, in addition to lubricating the bearings and dissipating the heat due to friction, etc., is used to operate the main admission valves. Considerable importance is attached to the oiling system, since its failure for thirty seconds would wreck the bearings, and possibly carry destruction to other parts of the machine. An auxiliary is also kept ready for immediate use, to prevent any such occurrence.

The spindle or revolving part of the high-pressure element with its generator rotor, together weighing nearly fifty tons, and turning at a speed of 1800 revolutions per minute, made a total of 218,980,800 revolutions. Had it been possible for a fly, for example, to remain during this trip on the tip end of one of the blades, he would have made a journey of 1,300,000 miles, or approximately 52 times the circuit of the earth, or approximately five and one-half times the trip from the earth to the moon.

This run is the more remarkable in that the unit consists of two turbine generator sets, each of which has been operated independently of the other, so that in effect the result has been the mechanical equivalent of operating a single machine continuously for 169 days.

When the Westinghouse Company installed the machine early in December there was no thought whatever of more than the ordinary weekly run, but abnormal weather conditions brought about such a demand for power that it was not considered economically advisable to shut it down until the date mentioned above.

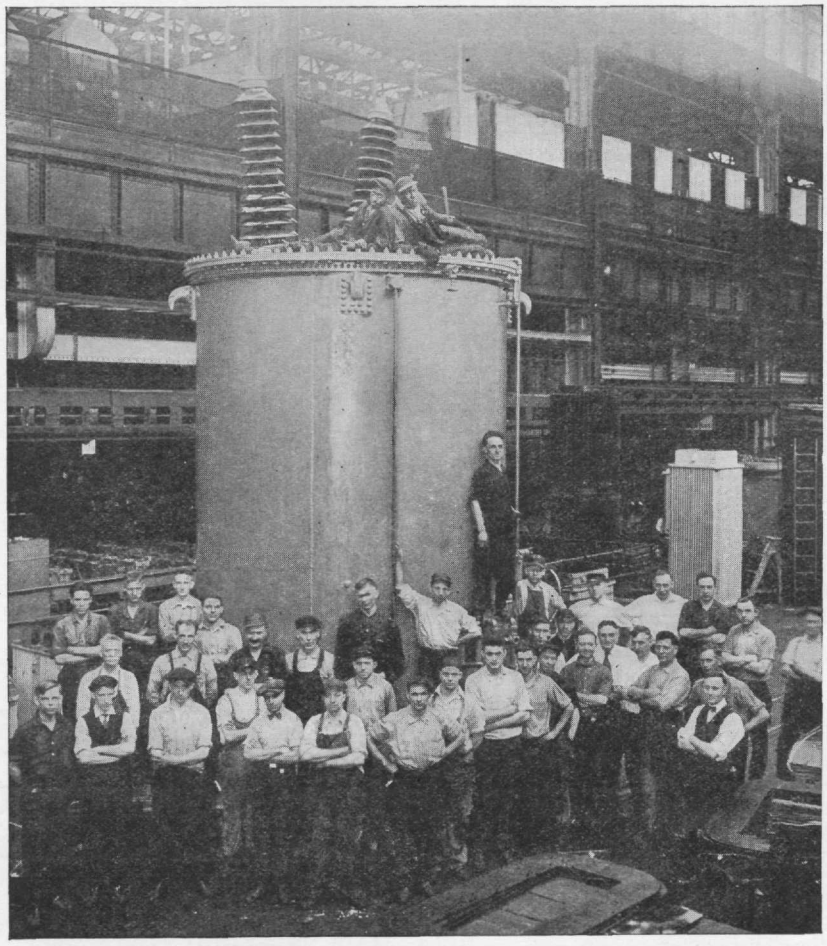
"Since the turbine is always on the job and without complaint," says Assistant Chief Engi-

neer F. M. Lucas of the Narragansett Company, "it may truly be classified as 100 per cent American."

Four of the largest transformers in the world, each of which has a capacity 35 per cent greater than the largest single-phase transformer heretofore constructed, were recently designed, built and tested at the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Co. and shipped to Colfax, Pa., on the Allegheny River, where all four will be installed in the new plant of the Duquesne Light Company.

Each of the transformer tanks has a diameter of nearly 10 feet and is approximately 16 feet high. With the bushings in place the total height is over 22 feet, measured from the wheels of the truck upon which the tank stands to the tip of the bushings. Each transformer weighs 63 tons of copper wire for the windings and 82 tons of the finest quality sheet steel obtainable for the magnetic circuit. Almost two miles of seamless copper tubing are required in the cooling systems of the four units.

The transformers at the Colfax station will be arranged in one bank of three with one spare for when filled with oil. Over 18 tons of special high grade oil is required for each transformer.



WESTINGHOUSE TRANSFORMER

The four transformers required some 14 miles use on occasions of necessity. The transformers will step up the output of a three-element 70,000 kva. steam turbine, from the generating voltage of 11,500 volts to a transmission voltage of 66,000 volts. Provision is made so that when this generating station reaches its ultimate capacity the transmission voltage may be increased to 132,000 volts. This will be necessary owing to the great amount of power which will be generated at this station.

Ain't It The Truth, L. A.?

"There's a story in this paper of a woman that used a telephone for the first time in eighty-three years."

"She must be on a party line."—Notre Dame Juggler.

The Villian!

"I call that dress a crime," said Hupp.
Replied his storm and strife,
"Stop jawing now and hook me up!"
So he fastened the crime on his wife.
—Boston Transcript.